

# Apparatus and Method for Routing a Transmission Line through a Downhole Tool

## Abstract

An apparatus and method for routing a transmission line through a tool joint having a primary and secondary shoulder, a central bore, and a longitudinal axis, includes drilling a straight channel, at a positive, nominal angle with respect to the longitudinal axis, through the tool joint from the secondary shoulder to a point proximate the inside wall of the central bore. The method further includes milling back, from within the central bore, a second channel to merge with the straight channel, thereby forming a continuous channel from the secondary shoulder to the central bore. In selected embodiments, drilling is accomplished by gun-drilling the straight channel. In other embodiments, the method includes tilting the tool joint before drilling to produce the positive, nominal angle. In selected embodiments, the positive, nominal angle is less than or equal to 15 degrees.